

Amendments to The Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Original): A method for allocating resources of a service provider to a plurality of users of the service provider in a data processing system wherein the resources are maintained in a resource pool when not allocated to a user and comprise a plurality of first and second resources, each second resource being associated with a first resource for use together with the associated first resource, and wherein, to invoke performance of a service by the service provider, a user issues a first resource request, requesting a first resource, one or more second resource requests, requesting one or more second resources, and, following receipt of the requested resources, issues a service request including the received first resource and at least one received second resource, requesting performance of the service, the method comprising steps of:

dispensing dummy resources to a user in response to the first and second resource requests, each dummy resource representing a resource requested by the user; and

in response to the service request from the user, allocating corresponding resources from the resource pool to dummy resources dispensed to the user.

2. (Original): A method as claimed in claim 1 wherein corresponding resources from the resource pool are allocated to dispensed dummy resources according to the best match between the set of resources represented by the dummy resources dispensed to the user and groups of associated first and second resources in the resource pool.

3. (Original): A method as claimed in claim 1 including, in response to the first and second resource requests from a user, reserving a resource in the resource pool corresponding to each resource requested by the user.

4. (Original): A method as claimed in claim 3 including:

(a) in response to a first resource request from a user, determining whether the resource pool contains an unreserved first resource, if so reserving that first resource for the user, and if not obtaining a new first resource from the service provider, adding the new first resource to the resource pool and reserving that resource for the user;

(b) in response to a the second resource request from the user, determining whether a first group of resources, comprising the first resource reserved for the user and any second resources associated with that first resource in the resource pool, contains an unreserved second resource corresponding to the resource requested in the second resource request, if so reserving that second resource for the user, and if not:

(c) determining whether the resource pool contains a second group of associated, unreserved first and second resources, which group comprises all the resources requested by the user, and if so reserving those resources in the second group for the user and removing the reservations on resources previously reserved for the user.

5. (Original): A method as claimed in claim 4 wherein, if it is determined in step (c) that the resource pool does not contain the second group, the method includes obtaining from the service provider a new second resource, associated with the reserved first resource, corresponding to the resource requested in the second resource request, adding the new second resource to the resource pool and reserving that resource for the user.

6. (Original): A method as claimed in claim 4 wherein, if it is determined in step (c) that the resource pool does not contain the second group, the method includes determining whether:

- (1) the resource pool contains a third group of associated first and second resources which includes all the resources requested by the user and in which one or more of the resources is reserved; and
- (2) the first group of resources includes a resource corresponding to each reserved resource in the third group;

if so, interchanging the reservations between the first and third groups and reserving for the user the resource in the third group corresponding to the resource requested in the second resource request, and if not obtaining from the service provider a new second resource, associated with the reserved first resource, corresponding to the resource requested in the second resource request, adding the new second resource to the resource pool and reserving that resource for the user.

7. (Original): A method as claimed in claim 4 wherein, if it is determined in step (c) that the resource pool does not contain the second group, the method includes steps of:

determining whether the resource pool contains a plurality of further groups of associated first and second resources, one or more of the further groups containing resources reserved for respective further users, such that the reservations for the users may be transferred between groups among the first and further groups to obtain a group which has one or more reservations for the user that issued the second resource request and which includes an unreserved second resource corresponding to the resource requested in the second resource request; if so, transferring the reservations between the groups and reserving the unreserved second resource for the user that issued the second resource request; and if not obtaining from the service provider a new second resource, associated with the first resource reserved for that user, corresponding to the resource requested in the second resource request, adding the new second resource to the resource pool and reserving that resource for the user.

8. (Original): A method as claimed in claim 3 including, in response to the service request from a user, allocating the resources reserved for the user to the corresponding dummy resources dispensed to the user.

9. (Currently amended) A method as claimed in claim 1 including replacing the dummy resources in the service request by the respective allocated resources ~~for~~ and forwarding the service request comprising the respective allocated resources to the service provider.

10. (Original): A method as claimed in claim 1 wherein the first resources comprise connection handles, each identifying a connection between the service provider and a user, and wherein the second resources comprise object handles, each identifying an object to be used by the service provider in performance of a service for the associated connection.

11. (Original): Apparatus for allocating resources of a service provider to a plurality of users of the service provider in a data processing system wherein the resources are maintained in a resource pool when not allocated to a user and comprise a plurality of first and second resources, each second resource being associated with a first resource for use together with the associated first resource, and wherein, to invoke performance of a service by the service provider, a user issues a first resource request, requesting a first resource, one or more second resource requests, requesting one or more second resources, and, following receipt of the requested resources, issues a service request including the received first resource and at least one received second resource, requesting performance of the service, the apparatus comprising:

a memory for storing the resources; and

control logic for receiving the first, second and service requests from the users, the control logic being adapted:

to maintain the resources in a resource pool of the memory when the resources are not allocated to a user;

to dispense dummy resources to a user in response to the first and second resource requests from the user, each dummy resource representing a resource requested by the user; and

in response to the service request from the user, to allocate corresponding resources from the resource pool to dummy resources dispensed to the user.

12. (Original): Apparatus as claimed in claim 11 wherein the control logic is adapted to allocate corresponding resources from the resource pool to dispensed dummy resources according to the best match between the group of resources represented by the dummy handles dispensed to the user and groups of associated first and second resources in the resource pool.

13. (Original): Apparatus as claimed in claim 11 wherein the control logic is further adapted to reserve a resource in the resource pool corresponding to each resource requested by the user in the first and second resource requests.

14. (Original): Apparatus as claimed in claim 13 wherein the control logic is adapted such that:

(a) in response to a first resource request from a user, the control logic determines whether the resource pool contains an unreserved first resource, if so the control logic reserves that first resource for the user, and if not the control logic obtains a new first resource from the service provider, adds the new first resource to the resource pool and reserves that resource for the user;

(b) in response to a the second resource request from the user, the control logic determines whether a first group of resources, comprising the first resource reserved for the user and any second resources associated with that first resource in the resource pool, contains an unreserved second resource corresponding to the resource requested in the second resource request, if so the control logic reserves that second resource for the user, and if not:

(c) the control logic determines whether the resource pool contains a second group of associated, unreserved, first and second resources which group comprises all the resources requested by the user, and if so the control logic reserves those resources in the second group for the user and removes the reservations on resources previously reserved for the user.

15. (Original): Apparatus as claimed in claim 14 wherein, if it is determined in step (c) that the resource pool does not contain the second group, the control logic obtains from the service provider a new second resource, associated with the reserved first resource, corresponding to the resource requested in the second resource request, adds the new second resource to the resource pool and reserves that resource for the user.

16. (Original): Apparatus as claimed in claim 14 wherein, if it is determined in step (c) that the resource pool does not contain the second group, the control logic determines whether:

- (1) the resource pool contains a third group of associated first and second resources which includes all the resources requested by the user and in which one or more of the resources is reserved; and
- (2) the first group of resources includes a resource corresponding to each reserved resource in the third group;

if so, the control logic interchanges the reservations between the first and third groups and reserves for the user the resource in the third group corresponding to the resource requested in the second resource request, and if not the control logic obtains from the service provider a new second resource, associated with the reserved first resource, corresponding to the resource requested in the second resource request, adds the new second resource to the resource pool and reserves that resource for the user.

17. (Original): Apparatus as claimed in claim 14 wherein, if it is determined in step (c) that the resource pool does not contain the second group, the control logic determines whether the resource pool contains a plurality of further groups of associated first and second resources, one or more of the further groups containing resources reserved for respective further users, such that the reservations for the users may be transferred between groups among the first and further groups to obtain a group which has one or more reservations for the user that issued the second resource request and which includes an unreserved second resource corresponding to the resource requested in the second resource request; if so, the control logic transfers the reservations between the groups and reserves the unreserved second resource for the user that issued the second resource request; and if not the control logic obtains from the service provider a new second resource, associated with the first resource reserved for that user, corresponding to the resource requested in the second resource request, adds the new second resource to the resource pool and reserves that resource for the user.

18. (Original): Apparatus as claimed in claim 13 wherein the control logic is adapted to allocate the resources reserved for the user to the corresponding dummy resources dispensed to the user in response to the service request from the user.

19. (Amended) Apparatus as claimed in claim 11 wherein the control logic is adapted to replace the dummy resources in the service request by the respective allocated resources ~~for~~ and forwarding the service request comprising the respective allocated resources to the service provider.

20. (Original): Apparatus as claimed in claim 11 wherein the first resources comprise connection handles, each identifying a connection between the service provider and a user, and wherein the second resources comprise object handles, each identifying an object to be used by the service provider in performance of a service for the associated connection.

21. (Original): Data processing apparatus comprising:

a service provider for performing services for a plurality of users, the service provider being operable to supply resources for use by the users, the resources comprising a plurality of first and second resources, each second resource being associated with a first resource for use together with the associated first resource, and

a resource dispenser arranged to receive the resources supplied by the service provider, the resource dispenser comprising apparatus for allocating resources of a service provider to a plurality of users of the service provider in a data processing system wherein the resources are maintained in a resource pool when not allocated to a user and comprise a plurality of first and second resources, each second resource being associated with a first resource for use together with the associated first resource, and wherein, to invoke performance of a service by the service provider, a user issues a first resource request, requesting a first resource, one or more second resource requests, requesting one or more second resources, and, following receipt of the requested resources, issues a service request including the received first resource and at least one received second resource, requesting performance of the service, the apparatus comprising:

a memory for storing the resources; and

control logic for receiving the first, second and service requests from the users, the control logic being adapted:

to maintain the resources in a resource pool of the memory when the resources are not allocated to a user;

to dispense dummy resources to a user in response to the first and second resource requests from the user, each dummy resource representing a resource requested by the user; and

in response to the service request from the user, to allocate corresponding resources from the resource pool to dummy resources dispensed to the user.

22. (Original): Apparatus as claimed in claim 21 wherein the service provider is a message queuing program for performing message queuing services for the users.

23. (Original): Apparatus as claimed in claim 21 wherein the service provider is a database for performing database services for the users.

24. (Original): A computer program product comprising a computer usable medium having computer program code therein which, when run in a data processing system, carries out a method for allocating resources of a service provider to a plurality of users of the service provider in a data processing system wherein the resources are maintained in a resource pool when not allocated to a user and comprise a plurality of first and second resources, each second resource being associated with a first resource for use together with the associated first resource, and wherein, to invoke performance of a service by the service provider, a user issues a first resource request, requesting a first resource, one or more second resource requests, requesting one or more second resources, and, following receipt of the requested resources, issues a service request including the received first resource and at least one received second resource, requesting performance of the service, the method comprising steps of:

dispensing dummy resources to a user in response to the first and second resource requests, each dummy resource representing a resource requested by the user; and

in response to the service request from the user, allocating corresponding resources from the resource pool to dummy resources dispensed to the user.